Chapter 12

Financing climate change adaptation in Viet Nam: A perspective from the field

COORDINATOR

Toan Canh Vu [ISET]

AUTHORS

Toan Canh Vu [ISET]

Gwenn Pulliat [CNRS - ART-Dev]

Emmanuel Pannier [IRD - Paloc]

Etienne Espagne [AFD]

Abstract

This chapter investigates the financial aspect of climate change adaptation in Viet Nam. While providing a general overview of global climate finance, it focuses on the structure, main actors, flow, and use of adaptation finance in Viet Nam, and highlights the challenges that the country faces in effectively mobilizing and using resources for adaptation. This paper mainly draws on studies of adaptation policies and in-depth qualitative field research, as conducted by the authors throughout Viet Nam over the last seven years.

The results indicate an important gap in tracking adaptation spending and measuring the impact of adaptation finance. A monitoring and evaluation system is therefore needed. This system needs to track not only formal financial flows, but also various resources that are often mobilized for adaptation at the local level. This chapter also reveals a significant financial gap at the provincial, and especially the community level, and calls for urgent national and international commitment to support local adaptation. This gap is partly explained by the limited integration of adaptation into development planning and state budget regulations, as well as by the weak engagement of the private sector. In addition, a concern is raised regarding how to better harmonize development objectives with the adaptation agenda. Moreover, climate adaptation projects often target the reduction of hazard exposure through hard infrastructure, rather than reducing social and economic vulnerability. This may come with adverse effects with regard to long-term adaptation. Therefore, in addition to the lack of funding dedicated to adaptation, the way funding is used and monitored also appears to be a crucial issue.

Tóm tắt

Chương 12 phân tích vấn đề tài chính liên quan đến công tác thích ứng với Biến đổi khí hậu (BĐKH) ở Việt Nam. Bên cạnh việc cung cấp một bức tranh tổng thể về tài chính khí hậu trên thế giới, báo cáo này tập trung xem xét hệ thống tổ chức, các bên liên quan chính, các nguồn vốn và cách thức sử dụng và phân bổ ngân sách về thích ứng với BĐKH ở Việt Nam cũng như làm rõ những thách thức liên quan đến việc huy động và sử dụng hiệu quả các nguồn lực dành cho công tác thích ứng. Chương này được xây dựng dựa trên các phân tích về chính sách và kết quả của một số nghiên cứu định tính chuyên sâu được thực hiện bởi các tác giả trong 7 năm vừa qua. Kết quả nghiên cứu cho thấy một lỗ hổng quan trọng trong việc theo dõi và đánh giá hiệu quả của các hoạt động tài chính cho thích ứng. Vì thế, việc xây dựng một hệ thống theo dõi và đánh giá là hết sức cần thiết. Hệ thống này cần theo dõi không chỉ các nguồn tài chính chính thức mà cả các nguồn lực khác nhau thường được huy động cho hoạt động thích ứng ở cộng đồng. Báo cáo này cũng chỉ ra sự thiếu hụt nghiêm trọng về nguồn lực tài chính ở cấp tỉnh và đặc biệt là cấp cộng đồng và kêu gọi sự cam kết mạnh mẽ của chính quyền cấp quốc gia và các nhà tài trợ quốc tế nhằm hỗ trợ cho công tác thích ứng ở các địa

phương. Sự thiếu hụt về tài chính cho công tác thích ứng một phần là do sự hạn chế trong lồng ghép thích ứng với BĐKH vào các quy hoạch phát triển và vào các quy định về ngân sách của nhà nước cũng như mức độ tham gia hạn chế của khu vực tư nhân. Bên cạnh đó, nghiên cứu của chúng tôi nhấn mạnh sự cần thiết phải cân bằng và kết hợp giữa các mục tiêu về tăng trưởng và thích ứng. Ngoài ra, hiện nay các nỗ lực về thích ứng thường tập trung vào việc giảm thiểu mức độ phơi nhiễm với hiểm họa thông qua các giải pháp công trình thay vì giảm thiểu tính dễ bị tổn thương về xã hội và kinh tế. Điều này có thể tạo ra những tác động bất lợi về lâu dài với công tác thích ứng. Vì vậy, bên cạnh sự thiếu hụt về tài chính thì cách thức nguồn vốn cho thích ứng được sử dụng và giám sát cũng là một vấn đề hết sức quan trọng.

Résumé

Le chapitre 12 aborde les aspects financiers de l'adaptation au changement climatique. Après un aperçu des modes de financement à l'échelle internationale, il présente les structures, les principaux acteurs ainsi que les flux du financement de l'adaptation au Viet Nam tout en soulignant les principaux défis auxquels le pays fait face pour mobiliser et allouer ces ressources. Ce chapitre s'appuie sur plusieurs recherches de terrain qualitatives menées à travers le Viet Nam au cours des sept dernières années.

Dans un contexte où le suivi des fonds dédiés à l'adaptation et l'évaluation de l'impact du financement de l'adaptation présentent d'importantes lacunes, ce chapitre souligne la nécessité de la mise en place d'un système de suivi et d'évaluation. Ce système doit suivre non seulement les flux financiers officiels mais aussi les diverses ressources en dehors des flux officiels mobilisées pour l'adaptation au niveau local. Face à l'insuffisance du financement de l'adaptation au niveau des provinces et des communautés locales, les auteurs appellent également à un engagement national et international fort et urgent pour soutenir l'adaptation au niveau local. Ces insuffisances s'expliquent en partie par une prise en compte limitée de l'adaptation dans les plans de développement, par le mode de fonctionnement du budget national, ainsi que par la faible implication du secteur privé. Un enjeu majeur réside dans la combinaison des ambitions de développement avec les objectifs d'adaptation. Enfin, les projets d'adaptation au changement climatiques tendent à privilégier la réduction de l'exposition aux aléas climatiques au moyen de lourdes infrastructures, au détriment des mesures de réduction de la vulnérabilité sociale et économique. A long terme, cette tendance risque d'être contre-productive en termes d'adaptation. Nous estimons pour conclure qu'en plus des manques de fonds dédiés à l'adaptation, la manière dont les fonds sont utilisés et contrôlés s'affirme comme un enjeu central.

Note: This chapter is partly based on a previous published work: Pannier, E., Vu, T. C., Espagne, E., Pulliat, G., & Nguyen, T. T. H. (2020). The Three Dialectics of Adaptation Finance in Viet Nam. Sustainability, 12(18), p. 7691. https://www.mdpi.com/2071-1050/12/18/7691

1. Introduction

Adapting to climate change is probably one of the biggest challenges facing Viet Nam today, and in the near future. As shown in the previous chapters of this report, even if the Paris Agreement's goals are met and global warming remains below the 2°C line — eventually falling to 1,5°C — the country will experience strong consequences from climate change, and from sea level rise, temperature increases and changing rain patterns in particular. Thus, while pursuing the goal of an economic development pattern that minimizes the greenhouse gas (GHG) emissions, the country is still seeking to foster a development path that contributes to adaptation and reduces climate change vulnerability.

In the field of climate change, adaptation is defined as the process of adjustment to actual or expected climate change and its effects [IPCC, 2014]. It refers to all actions undertaken to better cope with the effects of climate change, and to moderate or avoid harm to human systems. Specifically, adaptation concentrates on reducing human systems' vulnerability to potential impacts and therefore includes a wide range of actions, such as changing agricultural practices to less climate sensitive crops or transforming housing settlements. At the international level, the first priority has been mitigation, in order to maintain global warming below the 2°C line. But adaptation is being given growing scrutiny, as it appears that adapting to a changing environment is also crucial for addressing ongoing climate change. Therefore, an increasing share of international climate change finance is expected to target adaptation.

At the local level, several adaptation actions have already taken place. From relocating houses to mitigate exposure to floods to changing livelihoods towards less climate-sensitive sources of income, several types of actions and projects are helping to foster adaptation (see Chapter 11). These adaptation actions are funded through multiple channels. With the increasing attention being paid to adaptation by policymakers, it is expected that more funding will be available to strengthen adaptation actions and initiate new projects. At both international and local level, adaptation funding exists to specifically foster such actions. However, there is not a precise overlap between adaptation practices that take place on the ground, and the adaptation funding available at different levels (from international to local).

Viet Nam provides an interesting situation to study adaptation finance. The country receives international funding through various agencies, including for instance the Green Climate Fund, the World Bank or Japan International Cooperation Agency (JICA), and allocates its own resources to climate change adaptation. However, it is not always easy to follow up and trace the adaptation actions that have been funded through these channels: at the global as well as the national scale, there is no standardized system of reporting [Sancken, 2020; Roberts and Wiekmans, 2017]. Meanwhile, a wide range of adaptation actions are taking place on the ground that may be funded either by these adaptation funds, or by other funding sources that are not specifically targeted towards adaptation, but which nonetheless contribute to adaptation policies. Therefore, in this chapter, we intend to unfold how adaptation finance works in practice in Viet Nam, looking from both perspectives:

- How does international and national funding flow, from the top to the scale where climate actions are implemented?

▸Meanwhile, on the ground, what adaptation actions are being identified and reported as such? How are these actions funded, and via which funding channels?

This research is based on first-hand data gathered in different locations in Viet Nam and on an analysis of climate-related reports and official data. This chapter also discusses the question of adaptation finance at the larger scale, to provide the background to the Vietnamese case.

After presenting the datasets and methods that we use, the chapter will present the international background of climate adaptation finance, then our results in the Vietnamese case study. A discussion on the use of adaptation funding follows.

2. Sources and data

The data and analysis provided in this chapter are based on a combination of document review [1], semi-structured interviews and direct observation of the implementation of adaptation projects and local responses to climate-related hazards.

Our investigation shows that quantitative data reporting how adaptation funding is used is currently lacking in Viet Nam — as well as at a larger scale [Roberts and Weikmans, 2017]. An exhaustive assessment of adaptation funding is therefore difficult, due to the current state of the reporting mechanism (or lack thereof). We nonetheless mobilize quantitative assessments based on official documents that were provided by MoNRE and the Department of climate change (DCC), and provincial level reports on the implementation of both the national target program to respond to climate change and similar action plans. There are several limits to the use of such quantitative data for our purpose. First, a share of Official Development Aid (ODA) funding from international donors is integrated into the national budget and allocated for various projects that are either directly focused on climate change, or related to environmental issues, disaster risk reduction, agriculture, or infrastructure projects that are linked to adaptation but for which climate change adaptation is not the main goal. Therefore, using the available data, it is impossible to distinguish between international and national funds, nor to identify the respective share of funds coming from each channel that are used for each project. Secondly, the DCC's data include only information related to projects under their management, and do not cover projects and initiatives managed by other ministries, provincial governments, or initiated by NGOs. Thus, it only provides a partial picture of what is taking place in the field.

Our primary goal is to depict and analyse the actual process of climate change adaptation in the field: a qualitative approach is therefore required to allow us to examine the mechanisms at play beneath the implementation of adaptation actions. Our main dataset is thus based on semi-structured interviews. We have used semi-structured interviews and obser-

1. The document review consists of academic articles on climate change in general and adaptation finance in particular (in Viet Nam as well as at the international scale), official reports from different governmental, non-governmental (NGOs, research institutions, etc.) and international (UNFCCC, Green Climate Fund, WB/MPI, GIZ/Adelphi, etc.) organizations, and projects related to climate change adaptation policy and its implementation. We also reviewed documents related to Viet Nam's policies and plans, such as the national target program on climate change, provincial level action plans to respond to climate change, etc. This review allows us to depict the general landscape of adaptation policy in Viet Nam, and its wider international background.

vations that were conducted between 2016 and 2021, via a set of field-surveys in various provinces of Viet Nam (Ha Noi, Lao Cai, Bac Kan, Ha Nam, Thua Thien Hue Binh Dinh and Can Tho) with a wide range of interviewees at different levels (central, province, district, and commune). The main groups of interviewees we interacted with include: (i) national government agencies under the Ministry of Natural Resources and Environment (MoNRE), the Ministry of Agriculture and Rural Development (MARD), and the Ministry of Construction; (ii) provincial and district level agencies in charge of climate change, disaster risk management, urban development, planning, and investment and finance; (iii) international and Vietnamese NGOs; (iv) mass organizations; (v) local communities; and (vi) research institutions.

In addition to these interviews, we conducted in-depth ethnographic fieldwork between 2019 and 2021 in rural communes in the Northwest upland, Central Viet Nam (Thua Thien Hue) and the Mekong Delta River (Ben Tre), where populations had recently suffered from extreme events (such as flash flood, landslide, salinization, drought). We studied their experience of the climate hazard, their risk perception and their responses. We paid particular attention to the various material and immaterial resources they mobilized — ranging from state support to interpersonal social networks, banks and private donations — to restore and adapt after the disaster (see details of the method and results in Chapter 11).

3. Adaptation finance: the global landscape

3.1 A climate justice concern

A specific issue of global climate change finance relates to the "common but differentiated responsibility" regarding climate change. It refers to the fact that, historically, some countries have greatly contributed to the anthropogenic emissions of GHG — and are therefore the main contributors to global warming — while other countries, which have sometimes been marginal contributors to such emissions, are expected to be highly impacted by global warming's environmental consequences. This principle was adopted under the Kyoto Protocol and reaffirmed in the Paris Agreement; it implies that developed countries must provide financial assistance to developing countries to achieve UNFCCC goals. The international flow of climate finance contributes to this principle.

This idea is based on a principle of justice. Because some countries are more responsible for current and future climate impacts, they should contribute more to correcting such impacts. Meanwhile, countries that are more vulnerable to climate impacts need to be compensated for the harm they suffer. This is a principle of compensatory justice [Khan *et al.,* 2020]. But enforcing climate justice at the global scale is challenging. The climate timescale induces a significant gap between the release of GHGs into the atmosphere and their adverse effects on human systems. Negotiations involve countries and national entities, while spaces and populations within countries are unevenly impacted by climate change. Additionally, a certain level of uncertainty remains as to the expected impacts of future climate changes (see Chapter 1 in the case of Viet Nam). All these dimensions come

together to blur the assessment of a fair level of compensation between the parties.

Nonetheless, adaptation finance flows at the global scale are a means of contributing to compensatory justice. Grasso (2009) defines adaptation finance justice as a fair process of raising adaptation funds according to responsibility for climate impacts, and of allocating those funds with priority given to the most vulnerable. However, within the climate arena, parties tend to pursue their own interests and try to minimize their own contributions to the global climate cost. Do vulnerable countries receive a fair share of global climate finance to compensate for the harm they undergo, and to adapt to climate change? Do they receive enough support to foster an adequate adaptation strategy?

To answer these questions, it is first crucial to identify the climate finance flows that target vulnerable countries, and assess whether these flows enable actual adaptation to climate change.

3.2 The landscape of adaptation finance at global scale

According to the UNFCCC, climate finance refers to "local, national or transnational financing — drawn from public, private and alternative sources of financing — that seeks to support mitigation and adaptation actions that will address climate change". What it embeds is therefore very broadly defined. Global climate finance, according to this definition, totals some USD 500 billion per year, and is mostly spent domestically (81% of global climate finance was spent domestically in 2015–2016 according to Padraig, Clark, and Meattle (2018)). However, most of it goes to mitigation, especially investments in renewable energies. Adaptation finance is estimated at USD 22 billion per year (2015–2016), although the lack of reporting makes it difficult to establish a clear picture of the trends. According to these estimates, adaptation represents only some 5% of global climate finance.

Following the Paris Agreement, the global budget allocated to adaptation is likely to increase, since the international climate organizations and conferences have stated that adaptation and mitigation were equally important in addressing the challenges brought about by climate change. The UNFCCC has long stated that mitigation and adaptation funding should be balanced, with a specific focus on adaptation for countries considered to be highly vulnerable to climate change impacts, such as Small Islands Developing States. But no clear guidance or commitments have been established to this end [Roberts and Weikmans, 2017].

According to Padraig, Clark and Meattle (2018), in 2016 — and at global scale — the private sector provided 63% of climate finance flows, while the public sector provided 37%. The public channels are diverse, including the UNFCCC and Paris Agreement mechanisms, but also other channels such as development banks, multilateral, regional and national funding [Sancken, 2020]. As for international public funding, the main agencies are the Global Environment Facility (GEF) and the Green Climate Fund (GCF), which manage funding provided by donors. The GEF also manages two extra funds: the Special climate change Fund (SCCF) and the Least Developed Countries Fund (LDCF). Additionally, the Adaptation Fund (AF) was set up under the Kyoto Protocol in 2001, and contributes to adaptation projects in developing countries that are particularly vulnerable to climate change. Since its

foundation in 1994, the GEF has transferred USD 14.7 billion to beneficiaries. The Green Climate Fund, which started to operate in 2014, began with a budget of USD 7.1 billion for its initial resource mobilization — a figure that has expanded to reach USD 10.3 billion as of July 2020, provided by 49 countries, regions and cities.

3.3 The follow-up of climate adaptation projects

Despite the increasing attention to adaptation policies, following up adaptation actions remains challenging. There are several reasons for this situation. First, adaptation to climate change is often not the only goal pursued by a specific project. In particular, projects that are funded through bilateral ODA (Official Development Assistance), for example, may include several goals including climate adaptation — but adaptation would not be the primary goal of the project. Hence, to what extent should these kinds of composite projects be considered to be adaptation actions? Weikmans (2018) expresses concern because part of international adaptation funding has been integrated into general development aid (ODA), and because some countries report some ODA-funded projects as adaptation contributions even though they are only loosely related to climate goals. This can result in over-estimation of adaptation finance.

Second, there is no standardized reporting system for adaptation finance. Sources of finance are various: there are international agencies and bilateral agreements as well as national funding, alongside both public and private sources. This makes it difficult to gather data regarding the funds that contribute to adaptation policies. Some private funding may not be published [Sancken 2020] since reporting is not mandatory, even if they do contribute to adaptation. Additionally, adaptation projects are spread over various sectors, such as energy, transportation, agriculture or other sectors. Because there are typically several budget lines for adaptation projects, identifying specific adaptation finance requires a detailed breakdown that may not be available. To date, the tools to assess adaptation finance consistently at the global scale are lacking.

In addition to assessing the level of adaptation finance, it is not always easy to measure the effectiveness of adaptation policies, and thus the impact of adaptation finance in climate change response. While mitigation can be reasonably well measured by tons of GHG that were either avoided or sequestered, it is much more difficult to measure the harm that was avoided thanks to adaptation actions, especially in a context of high uncertainty. As opposed to mitigation, in which GHG emissions are used as a metrics to measure achievements, no such metrics exists for adaptation. It is therefore likely that the funding of policies that only contribute marginally to adaptation may be counted as adaptation finance, simply because they were funded through such channels and regardless of the actual result. Conversely, several actions that foster adaptation (for instance, changes in agricultural practices) are not identified as such and are funded through other channels (such as agricultural policies).

Climate finance has primarily targeted mitigation, and adaptation has only recently emerged as equally important. While several countries have defined national targets for GHG emissions, especially since the Kyoto protocol, there are no clear goals for adaptation. While

the need for adaptation will be linked to the actual climate changes, and therefore to mitigation efforts, no clear milestone has been defined so far. Moreover, international agreements on climate change state that adaptation funding must be "new and additional" to existing international development aid. This is a critical aspect of the compensatory justice that frames the international climate response. To date, due to the lack of consistency in reporting systems and the lack of clear and systematic distinction between ODA for general development and the international adaptation aid that flows through ODA, it is difficult to assess whether the latter is actually "new and additional", or whether some ODA has simply been reoriented from general development towards adaptation actions. While ODA is useful to foster adaptation, it remains critical that funding of the extra costs resulting from climate change is met by international climate response, in supplement to general ODA. Overall, the urgency of climate adaptation implies that adaptation should be mainstreamed in development policies in general. It is crucial that the paths of development that are fostered today through international financial flows systematically address climate adaptation in the short- as well as long-terms, especially in the most vulnerable areas.

4. Adaptation Finance in Viet Nam

As already extensively emphasized in the previous chapters of this report, Viet Nam is considered a country that faces major impact from expected global warming and climate change. In particular, its deltas and coastal areas are expected to undergo substantial consequences: according to the National Adaptation Plan[2] for instance, 39% of the Mekong Delta could be flooded by 2100 if nothing is done. The forecast may be even more serious if we combine sea level rise dynamics with subsidence and salinity intrusion dynamics, as shown in Chapter 9. But even with a drastic reduction of GHG emissions at global scale, sea level rise will already significantly affect the low-lying areas of the country. Therefore, alongside mitigation plans to limit the amplitude of global warming and future changes, adaptation actions are essential and require significant funding. This section first describes the channels of adaptation finance in Viet Nam, then the practical flows of adaptation funding, and finally discusses the actual use of adaptation resources on the ground.

4.1 Adaptation finance actors in Viet Nam

International organizations

As a country that is highly vulnerable to climate change, Viet Nam has received significant international financial support. It often takes the form of Official Development Assistance (ODA) provided by bilateral and multilateral institutions such as the World Bank, the Asian Development Bank (ADB), the Japan International Cooperation Agency (JICA), the French Development Agency (AFD), USAID, or the Kreditanstalt für Wiederaufbau (KfW) together with the German Corporation for International Cooperation (GIZ). ODA funding is transferred directly to and managed by the central government. Most ODA takes the

2. https://www.greenclimate.fund/sites/default/files/document/readiness-proposals-Viet Nam-undp-adaptation-planning.pdf

form of loans; however, these organizations also provide some grants. Viet Nam has also been supported by United Nations (UN) agencies such as UNDP and UN-Habitat. These agencies work directly with national agencies, which are subsequently in charge of implementing the adaptation actions. For instance, UNDP often mobilizes resources and acts as a direct recipient from financial institutions such as the Green Climate Fund or Adaptation Fund, and then works with national ministries such as the Ministry of Natural Resources and Environment (MoNRE) and the Ministry of Agriculture and Rural Development (MARD), to implement adaptation projects at the national and provincial scale. To date, five projects have been funded by the GCF in Viet Nam. In 2020, the Adaptation Fund approved a project targeting the Mekong delta for a total amount of USD 6.3 million. In addition, international non-governmental organizations (NGO) also provide funding for adaptation projects; but a major difference is that NGOs often focus on working locally with local communities, rather than at the national scale.

Government actors

At the national level, the Ministry of Natural Resources and Environment (MoNRE) is assigned to lead and coordinate climate change policy development and implementation in Viet Nam. The ministry has been leading the implementation of major programs and policies. These programs include the National Target Program to Respond to climate change — NTPRCC (2011–2015), the National Target Program to Respond to climate change and on Green Growth — NTPRCC-GG (2016–2020), the Support Program to Respond to climate change (SPRCC), the National Strategy on climate change, and the National Adaptation Plan. MoNRE works closely with the Ministry of Finance and the Ministry of Planning and Investment to coordinate, allocate and manage funding mobilized for adaptation.

[Table 12.1]

Examples of adaptation projects funded by GCF in Viet Nam

FP013	Cross-cutting	Improving the resilience of vulnerable coastal communities to climate change related impacts	$29,523,000	$11,006,625	30/06/2016	60	$40,529,625
FP071	Mitigation	Scaling Up Energy Efficiency for Industrial Enterprises	$86,300,000	$410,900,000	01/03/2018	60	$497,200,000
FP125	Adaptation	Strengthening the resilience of smallholder agriculture to climate change-induced water insecurity in the Central Highlands and South-Central Coast regions of Viet Nam	$30,205,367	$126,087,475	12/03/2020	72	$156,292,842

Source: GCF Website.

A major field of action in terms of adaptation relates to disaster risk management, to mitigate the adverse effects of future hazards. As the national state management bodies for disaster risk management, the Ministry of Agriculture and Rural Development (MARD) and its Disaster Management Authority are responsible for developing and implementing natural disaster risk management policies, projects, and programs. As such, during the 2010–2015 period, MARD was the largest recipient of adaptation funding compared to other ministries [World Bank, 2015b], because the agricultural sector is considered key for adaptation.

MoNRE and MARD work closely with the Ministry of Planning and Investment (MPI) and the Ministry of Finance (MoF) to review and plan climate change adaptation and/or disaster risk management budgets. MPI is responsible for socio-economic development strategies, planning and investment at the central level, and for attracting, coordinating and managing ODA, concessional loans and foreign non-governmental aid. The ministry is also in charge of coordinating public development investment. In the process of project review and selection, MPI plays a very important role, since it is responsible for managing the appraisal of investment portfolios and port-folio-balancing capability in relation to proposed projects. The appraisal results serve as the basis for relevant ministries, agencies, and local authorities to revise project proposals, and complete pre-feasibility study reports before submitting them to the Prime Minister for approval. MoF is the state management body for finance management, budget allocation, and tracking of government budget spending. Specifically, MoF works closely with MPI to formulate annual and medium-term plans for public investment, to determine the total funds from different sources for these plans, to assess the capital and ability to balance the capital of relevant projects, and to guide local financial authorities to balance the regular budget in order to pay for the corresponding expenditures. MoF is also in charge of reporting the disbursement and finalization of the plans, programmes and projects to the central Government.

At the provincial level, the Department of Natural Resources and Environment (DoNRE), the Department of Agriculture and Rural Development (DARD), the Department of Planning and Investment (DPI) and the Department of Finance (DoF) play similar roles to their respective superior agencies at the national level. However, at the district and commune levels, there is currently no organizational structure or staff dedicated specifically to climate change adaptation. As a result, district Division for Agriculture and Rural Development and district and commune level Steering Committees for Natural Disaster Prevention and Control and Search and Rescue are often involved when an adaptation project takes place. However, although a regular budget, both from recurrent and investment sources, is planned for disaster risk management (often for disaster recovery), district and communal governments have rarely allocated funding exclusively for adaptation activities. Most adaptation projects implemented at the district and commune level have been directly funded and managed by the national and provincial agencies. There is therefore a discrepancy between the adaptation actions that take place at a local level, and the long-term management of adaptation policies at that level, as there are — to date — no dedicated bodies for climate action.

Local Non-Governmental Organizations and socio-political organizations

In addition to government agencies, mass associations such as the Red Cross, Women's Union, Farmer's Association, and Youth Union are important actors. These associations often operate under the aegis of the Fatherland Front. Present at all levels, mass associations serve as a relay (for information or resources) between the community and governmental levels. They are often mobilized to implement projects to support local communities, to mobilize and distribute financial resources for community-level disaster recovery, and sometimes for adaptation-related projects.

Last but not least, many Vietnamese NGOs have also played an important role in mobilizing funding — often from international sources — for adaptation. These organizations mainly work at the district, commune, and community level. They are also often directly involved in implementing adaptation projects.

4.2 Adaptation funding flows and mechanism

Tracking adaptation funding in Viet Nam — as in many other countries — is particularly challenging, as funding for climate change response is not clearly integrated into the existing planning and state budgeting system [World Bank, 2015b]. In addition, there is no specific system and tool to monitor and track adaptation spending in a comprehensive manner. Specifically, funding channelled through, and managed by, MoNRE is often well recorded. However, according to a national officer, there is no mechanism to track all adaptation projects managed by other ministries and the provincial government. In addition, a clear definition of what constitutes an adaptation intervention is not yet available. As a result, development projects without a climate change label may increase resilience and reduce vulnerability, but are not systematically counted. On the contrary, implemented climate change projects may have low or marginal benefit with regards to climate change response [World Bank, 2015b].

According to McElwee (2017), the country has received more than USD 7 billion for climate change response, mainly from major bilateral and multilateral institutions. ODA funding has played a major role in helping Viet Nam to implement climate change policies. It is expected that 94% of the funding required for implementing the National Strategy on climate change (NSCC) and the NTPRCC-GG will come from international sources [GoV, 2017]. During the 2016-2020 period, nearly VND 15,000 billion (or around USD 652 million) was mobilized from ODA sources for projects under the NTPRCC-GG. In addition, various NGOs have provided significant financial support to Viet Nam, which could have an important impact at the local scale. For example, during the 2010–2015 period, Hai Phong city was able to mobilize nearly VND 113 billion (or around USD 4.9 million) from these organizations for climate change adaptation activities [Hai Phong PPC, 2015]. It has funded projects for mangrove restoration, climate awareness, coastal resource management, sustainable livelihood development, etc. It is important to note that, although the Vietnamese government has made a significant effort to mobilize funding for climate change responses, the budget required to implement climate policies and plans is far more ambitious than the resources which the country has available [Phuong *et al.*, 2018].

The most important financing mechanism to manage climate change-related ODA funding is the SPRCC, the Support Program to Respond to climate change. This program was created in 2009 to mobilize financial support from development partners for implementing major national policies and programs, especially the NTPRCC and NTPRCC-GG. A policy matrix that identifies priority projects is used as the basis for mobilizing international support, and for allocating funding for climate change interventions. During the first phase (2009–2015), the SPRCC program raised nearly USD 1 billion in ODA support from bilateral and multilateral international donors, and expects to raise up to USD 1.2 billion for the second phase (2016–2025) [GoV, 2016]. International financial support to SPRCC is directed to the central budget, before being distributed to climate change projects under NTPRCC and specific SPRCC priority projects. The remaining funding could be integrated into the general state budget for other uses. According to a recent report, only around 35 percent of the resources mobilized under the SPRCC has been directly spent on climate change initiatives [ECORYS, 2018].

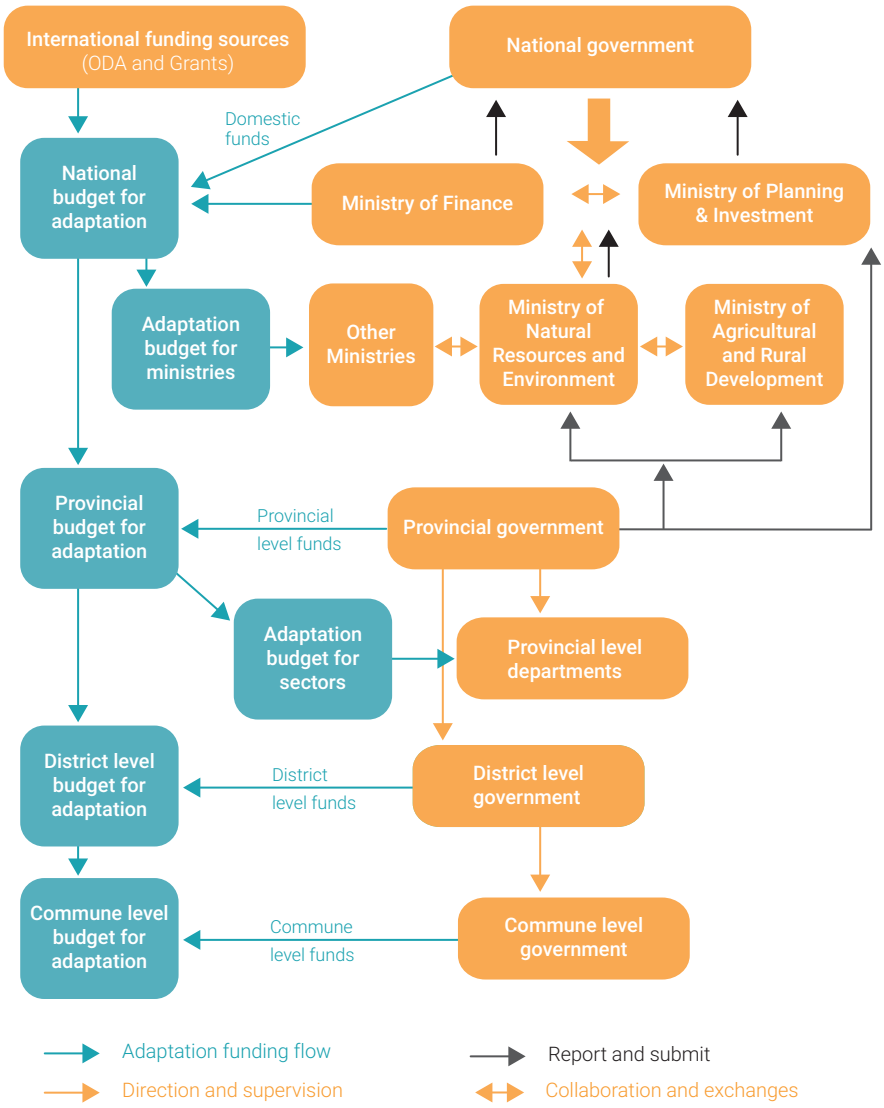
The funding received is managed and controlled according to the financial rules and regulations of the Vietnamese government. The central government generally merges its own resources with international funding. At the local level — in most projects funded via the SPRCC — there is also some contribution from the provincial government in the form of a counterpart fund. Figure 4.1 describes the process for allocating adaptation funds [3].

3. By national budget and provincial budget for adaptation we mean budget for adaptation at the national and provincial levels. It includes both investment and recurrent budget.

Provinces and national ministries submit their proposals once a year to MoNRE. MoNRE then reviews, evaluates, and selects prioritized projects, with the support and guidance of the National Committee on climate change. Proposals developed by provinces and ministries must nonetheless be consistent with the list of prioritized actions identified in national policies (such as the NTPRCC-GG, National Strategy on climate change, the plan for the implementation of the Paris Agreement, and the SPRCC). MoNRE then sends the list of selected projects to the Ministry of Planning and Investment (MPI) and the Ministry of Finance (MoF) for review. The most prioritized projects identified by MPI will be submitted to the Prime Minister for approval. The MPI allocates funding for selected projects from the national budget, then the MoF disburses the approved funding to provinces and ministries. A similar process is applied at the provincial level, where the district governments and provincial departments submit their proposals annually to DoNRE, which collaborates with the Department of Planning and Investment and the Department of Finance to review, select, and allocate funding (see Figure 4.1). The main difference is that no adaptation funding from bilateral and multilateral organizations is transferred directly to the provincial government.

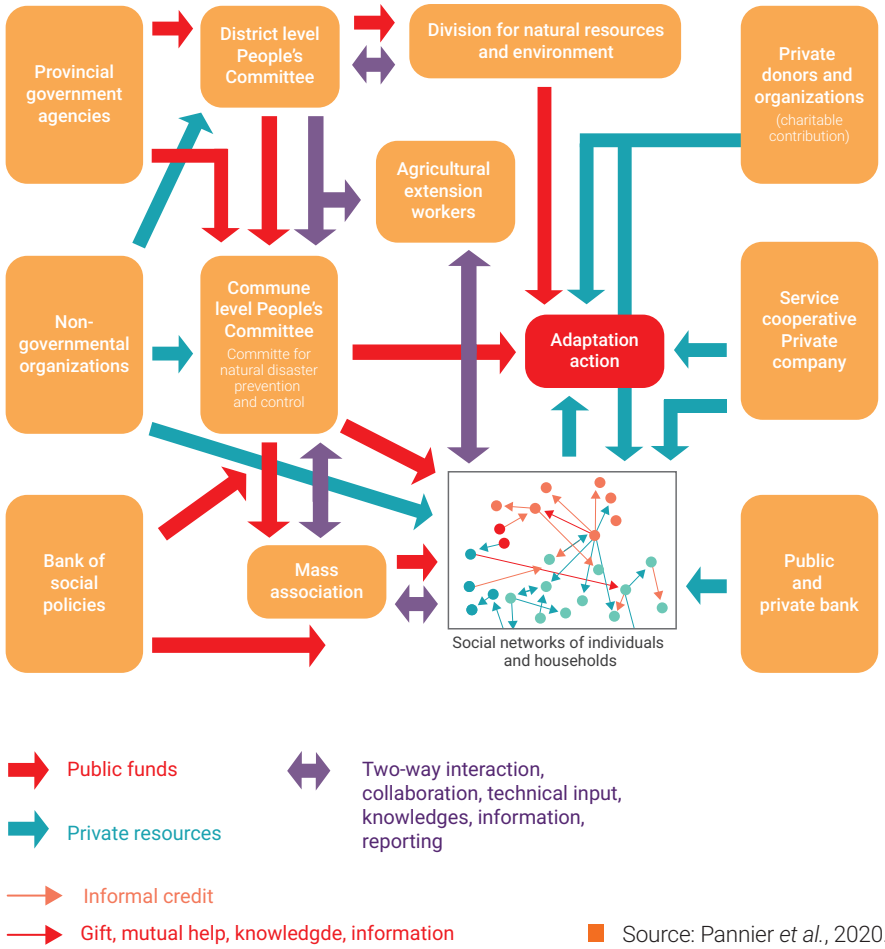
At commune level however, the adaptation finance flow and mechanism do not follow any single rule, and are often quite complex (see Figure 4.2). As stated previously, practically no formal financial resources are allocated exclusively for adaptation by commune-level government. However, resources (financial and non-financial) for disaster risk reduction and, in part, for adaptation at the community level may come from different sources, through different actors and networks, and in both formal and informal forms. For example,

[Figure 12.1]
Formal adaptation financial flow



Adapted from Pannier *et al.*, 2020.

[Figure 12.2]
Adaptation resource flow at the community level



Source: Pannier *et al.*, 2020.

vulnerable communities may receive funding or other support in the forms of information, knowledge, techniques, and agricultural inputs (seeds, fertilizer, crop protection products, etc.) that help improve agricultural practices in the face of climate change impacts [Pham *et al.*, 2019; Tran & Rodela, 2019]. Such support may come from commune, district and even provincial governments, as well as from non-governmental and mass organizations. Vulnerable communities can also access loans from public and private banks, or receive external support from private actors in the form of charitable contributions after disaster events. These resources are used for post-disaster recovery, and also to implement new adaptation strategies, such as changing housing structures or applying new crop systems and practices (see Chapter 11). All these resources contribute to climate adaptation, and can therefore be considered as part of climate finance.

Additionally, alongside this formal system, the "shadow system" [Stacey, 1996] — defined here as the set of interpersonal exchanges and arrangements occurring outside but in connection with the official institutions [Tran & Rodela, 2019] — also constitutes an important source of resources for adaptation. The review of existing studies and our research findings in Lao Cai suggest that local communities have access to different types of resources for small-scale adaptation activities. These resources come through informal local loan systems, local rotating savings and credit groups, informal safety nets, as well as labour exchange practices, land arrangements, and a strong flow of gifts and mutual services [Adger, 2000; McElwee *et al.*, 2010; Delisle & Turner, 2016; Fischer *et al.*, 2011; Pannier & Pulliat, 2016; Son & Kingsbury, 2020]. An event that we studied during our field research illustrates these informal finance flows and how they support adaptation. In 2018, a historical flash flood and landslide caused serious damage to local houses, infrastructures and livelihood in a Tày Commune in Lao Cai Province. As a result, many households decided to move their homes to a safer place or to rebuild higher and stronger houses in the same location. These actions were funded via five sources: (i) local government support ranging from VND 4 million to 40 million per household; (ii) "voluntary contributions" from individuals and public or private organizations, ranging from VND 500000 to VND 8 million ; (iii) bank loans (from VND 50 million to 100 million); (iv) funds from the market, such as extra-agricultural activities or other salaries, sale of agricultural produce etc.; and (v) resources obtained from interpersonal relationship networks in various forms, such as monetary gifts, interest-free or low-interest loans, material support (building materials, food for workers, etc.), credit when buying building materials, in-kind support (*e.g.* help for the construction work). We estimate that the last category contributed between 30% and 85% of the budget required to relocate or rebuild the houses. Hence, it reveals that interpersonal interactions, arrangements, and exchanges, framed by both the logic of indebtedness and of mutual help, and regulated by a strong sense of moral and social obligation [Delisle & Turner, 2016; Pannier & Pulliat, 2016], may significantly contribute to the implementation of climate change adaptation actions at the local level. Such essential financial sources are often overshadowed in climate finance.

4.3 The uses of resources for adaptation in practice

What does adaptation finance actually fund? What are the kinds of adaptation actions that occur in practice in the field? At all scales, the main approach for climate adaptation actions has been a technical one. The main use of climate finance is for large-scale infrastructure that aims at reducing the adverse effects of environmental hazards, such as building dykes against floods. The importance of disaster risk reduction and of strengthening the physical assets to make infrastructure more climate-resilient is underlined by international donors, such as the IMF in its latest report regarding climate change in Asia-Pacific region. While it requires very high funding, it has been given priority in Viet Nam.

At the national level, a study examining the climate change expenditure of five ministries (MoNRE, MARD, MOT, MOIT, and MOC) during the period before 2015 states that a major part of adaptation funding was used for large-scale infrastructure [GoV, 2016; World Bank, 2015b]. Specifically, MARD and MOT

[Table 12.2]

Local adaptation funding allocation for hard and soft measures

	Quang Nam	Ca Mau	Hai Phong
Funding planned for hard infrastructure solutions (%)	97%	90%	89,5%
Funding planned for soft measures (%)	3%	10%	10,5%

Source: Ca Mau PPC, 2020; Hai Phong PPC, 2020; Quang Nam PPC, 2020.

have the largest share of funding for climate change response, and the majority of their resource was used for irrigation systems, disaster-specific infrastructure and transportation projects [World Bank, 2015b]. Only a small portion of climate change funding was allocated to the improvement of climate-response governance, or to the design and effective implementation of adaptation policies. More specifically, little funding was dedicated to the development of sectorial and provincial climate adaptation plans (CAP) [World Bank, 2015b]. As a result, the quality of these plans and their implementation are rather limited [PEAPROS, 2012; Priambodo *et al.*, 2014].

The findings of this World Bank study are still relevant today. According to the list of projects under the National Target Program on climate change and Green Growth for the 2016–2020 period, nearly 80% of the total budget allocated to provincial government is used for "hard" infrastructure. The remaining funding is spent on soft measures, with the focus on forest plantation, protection, and restoration. In addition, there have been a limited number of projects aimed at addressing social, institutional, and environmental drivers of vulnerability. Vulnerability assessment was not even a legal requirement until recently, and thus was not a common practice in climate change adaptation planning processes.

At the provincial level, large-scale hard infrastructure is also the dominant approach for climate change response (see Table 4.2). For example, nearly 97% of funding for implementing the Quang Nam CAP for the 2021–2030 period is earmarked for "hard" measures, such as river embankment, dykes and pumping stations [Quang Nam PPC, 2020]. Nonetheless, overall actual funding to implement the provincial CAP remains relatively limited. Most provinces have to rely on financial support from the national level and external sources. In some cases, support from international organizations (in the form of grants) to provinces is much higher than from the national government. For example, during the 2010-2015 period, Can Tho received only VND 1.8 billion from the national government, while accessing some VND 27 billion from international donors [Can Tho PPC, 2016]. Similarly, 95% of funding needs for climate change activities in Da Nang over the same period was met by international organizations [Da Nang PPC, 2015].

The budget for adaptation actions implemented by local authorities often comes from the national government, and has mainly been used to develop infrastructure and large-scale adaptation projects. In several provinces, a small portion is allocated by the provincial government budget in the form of a counterpart fund. For instance, An Giang and Ben Tre provinces received VND 165 billion and VND 152 billion from the national government during the 2010-2015 period, and contributed around VND 47 billion and around VND 19 billion respectively from their own budget [An Giang PPC, 2015; Ben Tre PPC, 2015].

However, this situation is not the same across the country: many other provinces do not have access to this level of support. In many areas, there is no local finance to add to the national funding. For instance, Bac Kan, Ninh Thuan, and Dien Bien provinces received only VND 1 billion from NTPRCC and SPRCC funding, and could not mobilize local funding for climate change response activities over the same period [Bac Kan PPC, 2015; Dien Bien PPC, 2015; Ninh Thuan PPC, 2015]. In other words, there has been a significant financial gap to implement provincial climate adaptation plans (CAP). According to the reports on the implementation of the NTPRCC program at the provincial level during the 2010–2015 period, most provinces reported that they failed to fully implement their CAPs due to lack of financial resources. An officer from DoNRE said that: "Our department has received very limited funding to work on climate change. We got some support from the central government to develop the action plan to respond to climate change. However, most of the actions identified in this plan have not been implemented due to the lack of funding..." Similarly, a senior former government officer stated that: "There is a huge funding gap for adaptation at the provincial level, not to mention the district and commune levels." According to provincial reports on the result of the implementation of the NTPRCC for the 2010–2015 period in many provinces, very few actions identified in the provincial-level CAP for the 2010–2015 period were actually implemented. For example, none of the projects listed in the climate change action plans of Dien Bien, Ha Nam and Bac Kan provinces, and only one out of 16 priority projects of the Ninh Thuan CAP, were implemented by 2015 [Bac Kan PPC, 2015; Dien Bien PPC, 2015; Ha Nam PPC, 2015; Ninh Thuan PPC, 2015]. At the district and commune level, the situation is even more critical, since there are no or very limited financial resources for proper adaptation interventions.

At the community level, a large number of disaster risk management projects have been implemented. However, the focus is often on emergency response, short-term recovery and reactive actions, rather than interventions that address fundamental drivers of vulnerability and risks [McElwee *et al.*, 2017; McElwee *et al.*, 2010] (see Chapter 11), and longer-term and preventive solutions that are well informed by future climate change projections [Oxfam International, 2008]. For instance, only 2% of the funding planned for climate change and disaster responses was used for enhancing governmental capacities, and only 1% for developing adaptive capacity of communities and smallholder farmers [Phuong *et al.*, 2018; World Bank, 2015a].

Overall, at the provincial level, the current environmental governance does not enable full implementation of climate-response policies [Pulliat, 2019]. The priority given to costly large-scale infrastructure may result in an inadequate scaling of infrastructure, in parti-

cular in a context of high uncertainty regarding the magnitude of future events. Meanwhile, less costly measures — in particular regarding population preparedness — appear overlooked in the current pattern of climate adaptation finance.

Nonetheless, adaptation actions take place alongside and in addition to policies and climate-adaptation plans. There are cases in which development-oriented projects contribute to local adaptation. For example, in our case study in Nghia Do (in Lao Cai province), local communities have shifted from rice production to planting mulberry for raising silkworms. This project was initiated and implemented by a cooperative that had mobilized private and state funds to help improve local farmers' incomes. However, it has been proved that the project also contributes to helping local communities adapt better to climate change-related hazards, especially flooding. There is therefore a discrepancy between expected climate finance flows, implementation of planned climate policies, and actual adaptation actions that take place on the ground.

5. Towards effective mobilization and use of funding for adaptation

The lack of financial resources is often seen as a major challenge for adaptation in Viet Nam. However, in addition to attracting more financial support from international donors, it is important to investigate: (i) why there is not enough funding for climate change adaptation; (ii) how to ensure sustainable mobilization of funding for climate change response; and (iii) whether existing funding for adaptation has been used in an effective manner.

5.1 Adaptation and/or Development?

Regarding the first two questions, our study suggests that adaptation funding has mainly come from the support of international organizations earmarked for climate change; it is difficult to use existing development funding for purposes of adaptation. Climate change is often seen as a separate issue, under the responsibility of the natural resources and environment sector, as opposed to a development challenge, although climate-related disasters have caused significant damage to different sectors in Viet Nam, with annual economic losses estimated at 1.5% of the country's GDP [GoV, 2015]. In addition, proposed adaptation actions in sectorial and provincial climate action plans are often no more than a list of independent measures that are neither fully in line with, nor integrated into sectorial and socio-economic development plans. As a result, while the need for incorporating climate change into development planning has been highlighted in several national policies, including in the Law on Environmental Protection approved in 2020, climate change adaptation is currently poorly integrated both into the socio-economic development plan and those of other sectors, and into the regular State budgeting process and regulations.

Existing state budget regulations and processes contain neither a formal definition of

climate finance nor a classification of climate change funds. Climate change adaptation may be integrated into development policies, but no budget line is specifically dedicated to climate change adaptation in the state budget regulations, resulting in a lack of implementation of these policies. This is one of the main reasons for the lack of funding for adaptation at the local level, and for the implementation of provincial level action plans to respond to climate change. Therefore, we argue that in order to increase and sustain funding for climate change adaptation, available resources allocated for development programs should be mobilized for adaptation, and used in ways that meet both development and adaptation objectives. For this to happen, a detailed and clear legal foundation and guidelines must be in place. According to the Department of climate change, a decree guiding the implementation of the climate change mainstreaming requirement of the Environment Protection Law will be soon developed, and is thus expected to facilitate the use of development resources for climate and disaster risk-informed development, and thus for adaptation. However, a strong enforcement mechanism will be required to ensure the proper implementation of this decree.

5.2 Hard infrastructure vs soft solutions – reducing exposure vs. reducing vulnerability

With regards to the third question, we argue that although Viet Nam will need more financial resources for adaptation, it is important to make sure that available funding is allocated and used in an effective manner. As reported in Section 4.3, hard infrastructure has been used as the dominant approach for adaptation. Although hard infrastructure may be critical for tackling future climate changes and contributing to development objectives, it may barely contribute to adaptation [Eckardt *et al.*, 2016] or risk being maladapted [Balboni, 2019] if not carefully designed and planned. For example, some new and upgraded roads and dykes in Quy Nhon contributed to making flooding worse in the city during the historic flood in 2009 [DiGregorio & Van, 2012]. Similarly, a system of large dykes and sluice gates was built in the Mekong Delta to protect people living inside the dyke, at the expense of people outside the dykes [Schwab, 2014]. A study conducted by the World Bank and MPI revealed that many climate-related infrastructures projects of MARD and MOT are considered as having marginal climate change relevance [World Bank, 2015b]. In addition, hard infrastructure such as river dykes and embankments may modify the usual dynamics of hazards, and local ecosystems and services; their existence may induce a feeling of protection among the population, and lead to increased exposure combined with reduced preparedness when a major hazard occurs (such as centennial floods).

Moreover, we also found that costly climate-related infrastructure is often designed in ways that rarely take future climate change-related uncertainty into account [Lindegaard, 2013; Toan Vu, 2017]. Given the non-stationary nature of future climate change uncertainty [Milly *et al.*, 2008], this approach is no longer appropriate [Hallegatte, 2009; Lempert *et al.*, 2004], as the lock-in effect associated with large-scale and rigid infrastructure often lasts for decades, and may cause substantial losses when extreme events are more frequent and stronger than the design protection level [Hallegatte, 2009]. This infrastructure may also limit the scope for future adaptation [Dessai & Wilby, 2011; Lindegaard, 2013],

and even reduce Viet Nam's ability to effectively adapt to future climate change [Fortier, 2010], since the option value of a different climate scenario is no longer available. According to Schwab (2014), relying on defensive infrastructure is probably inefficient in a context of increased major hazards. This is not to deny the important role of hard infrastructure in some cases. However, as Viet Nam is expected to face more severe and unpredictable future climate change, and large-scale hard infrastructure often lasts for many decades, infrastructure investments are also the riskiest kind, since they are prone to unexpected and irreversible social and ecological impacts, potentially leading to maladaptation. As climate science tends to move fast, there is often no room to accommodate unexpected changes. In this context, climate change responses — flood risk management strategies and interventions, for instance – should prioritize flexible, reversible and robust options [Hallegatte, 2009; Wilby & Dessai, 2010], since these allow for adjustment under changing future climate conditions and for the ability to adapt to surprise in even extreme and unexpected situations [Klinke & Renn, 2002].

It is now generally accepted that adaptation efforts should focus on reducing vulnerability, and on supporting vulnerable populations [Awolala & Ajibefun, 2015; Barrett, 2015; Pickering, 2012]. However, decisions on adaptation finance distribution are seldom based on the level of vulnerability [Barrett, 2015; Hall, 2017]. According to Jeff Baum and colleagues (2015), at the global scale, addressing vulnerability is not clearly articulated in 66% of adaptation-labelled projects reviewed. The case of Viet Nam is no exception. Indeed, focusing on hard infrastructure solutions means that little funds have been allocated to other types of measures. The results of our study indicate a significant lack of funding for soft adaptation measures, and for actions aimed at addressing the social, cultural, economic, and institutional drivers of vulnerability. This finding is consistent with other adaptation studies in Viet Nam, such as Lindegaard's (2013) and Nguyen's and colleagues (2017). Meanwhile, the availability and capacity of local government officials – crucially important for the successful implementation of climate adaptation plans – have received limited attention. According to a national government climate change officer, despite significant funding for climate change response in Viet Nam over the last 10 years, the capacity of government staff working on climate change at the local level is still very limited. Our interviews with DoNRE's staff assigned to work on climate change in Ha Nam and Bac Kan provinces in early 2021 reveal that they are not trained on climate change adaptation planning. Moreover, in Ha Nam DoNRE, there are only two staff members working on climate change, and their responsibilities also cover water resource management, hydrology and meteorology. Similarly, at the commune level, there are no staff dedicated to climate change issues, and local authorities in charge of disaster risk management do not have any specific training on climate change risk and adaptation options (see Chapter 11 and Pulliat, 2019). These examples and further field study evidence suggest that the ways the funding is used may be equally or even more important than its quantity.

5.3 More funding for local adaptation

We have highlighted the critical funding gap for climate change adaptation at the provincial level, and especially for community level

actions. This problem can be attributed to the large share of adaptation funding dedicated to large-scale infrastructure projects that are often directly managed by national and provincial agencies, and by the limited integration of climate change adaptation into development planning, and budgeting processes and regulations. Therefore, more adaptation funding should be allocated at the community level and for community adaptation actions, and new rules need to be in place to facilitate the use of resources for development that supports local adaptation. At the global scale, the call for more funding at the local level has also been raised [Ayesha & Colleen, 2019; Ben Soltoff *et al.*, 2015; Fenton *et al.*, 2014; Soanes *et al.*, 2017]. The target of reaching USD 100 billion annually for all developing countries was set following the Paris Agreement, for both adaptation and mitigation actions [Soanes *et al.*, 2017]. However, there is a serious lack of international commitment to allocating adaptation funds to local communities [Fenton *et al.*, 2014], and thus climate finance rarely reaches the local level [Ayesha & Colleen, 2019]. Indeed, less than 10% of mobilized climate finance reaches local communities [Soanes *et al.*, 2017]. Therefore, a clear and strong national and international commitment is urgently needed. Otherwise, vulnerable communities will continue to suffer not only from climatic hazards, but also from the existing top-down and centralized approach of adaptation finance [Fenton *et al.*, 2014]. In addition, even when this commitment is in place, a strong mechanism needs to be developed to ensure that vulnerable groups receive support [Ben Soltoff *et al.*, 2015], and that they are the direct beneficiaries and actors in designing and implementing adaptation interventions [Soanes *et al.*, 2017].

5.4 Two financing bridges between local and national adaptation strategies

Viet Nam is characterized by a unique network of 18 subnational development banks (SDBs) [AFD, 2020], which could enable the government to better monitor local needs and the specificities of adaptation to climate change in its different regions and provinces. In order to understand the precise role these SDBs could play to facilitate climate adaptation, we need to picture the broader arrangement of the Vietnamese banking system.

Since 1988, the State Bank of Viet Nam (SBV) has played the role of the country's central bank, the financial regulatory agent and the guardian of monetary reserves. Simultaneously, state-owned commercial banks have seen their role enhanced. The SBV delegates its banking activities to four newly created state-owned commercial banks (SOCBs), each targeting a different segment of the economy: the Viet Nam Industrial and Commercial Bank — Vietinbank (industry and commerce); the Bank for Agriculture and Rural Development — Agrinbank (agricultural and rural development); the Bank for Foreign Trade of Viet Nam — Vietcombank (international trade), and the Bank for Investment and Development of Viet Nam — BIDV (infrastructure). Since the 2008 crisis, a new major banking reform has been implemented, separating commercial bank activities from development banking activities. As a result, Viet Nam has three national-level development banking institutions, namely the Viet Nam Bank for Social Policies (VBSP), Viet Nam Development Bank (VDB), Viet Nam Russia Joint Venture Bank (VRB), as well as eighteen local development investment funds, considered as non-financial institutions.

Through these local institutions, the government encourages the decentralization of infrastructure investments at the provincial level: "[…] as commercial bank financing and bond issuance did not prove to be the appropriate solution for the Provincial People's Committees (PPC) during this period, the Local Development Investment Fund model was considered more appropriate in this context" [AFD, 2017]. Although Local Development Funds are exempt from regulatory control by the Central Bank, they can use standard international financing market procedures. They serve as channels to mobilize resources from multilateral development banks, establishing partnerships with private local funds and becoming shareholders of private enterprises [Kiet, 2018; Hà, 2019].

This existing network of sub-national development institutions could provide the seeds for financial integration between local and national adaptation strategies. With its intimate knowledge of local adaptation needs, it would also be able to raise international funding targeted towards climate-related projects, dependent on climate-mainstreaming its operations. As an example, the Ho Chi Minh City Finance and Investment Corporation (HFIC) has certified its credit portfolio to become a climate bond issuer. In 2016, when the Viet Nam Ministry of Finance approved a pilot project for issuing sub-sovereign green bonds, the municipal People's Committee decided that the Ho Chi Minh City Finance and Investment State Owned Company would issue a VND 523.5 billion (USD 23 million) 15-year green bond, whose proceeds would be allocated to 11 projects related to the water, adaptation and infrastructure sectors [CBI, 2018].

In parallel, it is also argued that public financing institutions may not be sufficient to face the expected damage from current climate scenarios. It is true that Viet Nam has recently been constrained by its self-inflicted public debt ceiling of 65% of GDP. In this case, the argument goes, it is necessary to involve the private sector in financing the climate change National Adaptation Plan (NAP) process, notably through public-private partnerships. This strategy aims at harnessing available savings on the international financial markets, and driving them towards climate-virtuous investments in the countries which need them most. That strategy is sometimes called the Wall Street consensus [Dafermos *et al.*, 2021], as it combines private financial actors seeking returns on new climate-related financial assets with de-risking activities from public development institutions, to guarantee a predictable flow of returns for private investors. Although it may allow the faster deployment of financing, it also carries a risk of hidden costs for local and national public budgets if the public guarantee is suddenly called.

5.5 Monitoring and tracking adaptation spending

A system set up to track the finance flows and adaptation spending across sectors and levels, as well as a practical framework to evaluate how adaptation projects contribute to reduce vulnerability and build climate resilience, are important to ensure the effective and transparent use of adaptation funding. It is also an important factor to attract more external funding. These systems and frameworks will also help determine financial gaps and adaptation needs, deficits as well as barriers to public and private investments for adaptation. In 2016, the Viet Nam national plan for the implementation of the Paris Agreement set up the tasks to establish a Monitoring,

Reporting, and Verification (MRV) system for climate change adaptation activities at national and provincial levels, and to develop guidelines to monitor spending for responding to climate change.

Recently, some institutions under MoNRE have been working on financial monitoring and adaptation evaluation. For example, IMHEN has conducted research into developing climate change indicators to assess, notably, the effectiveness of adaptation projects (see Chapter 11). The Department of climate change also plans to develop a tool to track and monitor adaptation-related finance flows and spending. However, in over 10 years since the first NTPRCC was approved, such systems and frameworks are still not in place. A national government officer stated that there is neither a comprehensive tool for tracking and monitoring adaptation-related finance flows, nor an accounting system to specifically manage adaptation spending. But Viet Nam is not the only country that is facing this challenge. At the global level, there has not been a consensus over approaches and methodologies to determine adaptation finance and adaptation projects [Hall, 2017]. In addition, the distinction between finance for adaptation and for development is not always clear, so it is difficult to track the exact funding allocated to adaptation [Banhalmi-Zakar *et al.*, 2016; Trabacchi & Buchner, 2017]. It has even been said that there is an "absence of an internationally agreed definition of what qualifies as adaptation finance" [Trabacchi & Buchner, 2017, p. 6].

6. Conclusions

This chapter has presented the complex landscape of adaptation finance in Viet Nam, and analysed the way resources for adaptation circulate. It is clear that Viet Nam has made a great effort in responding to climate change in general, and climate change adaptation in particular. A significant level of funding has been mobilized. However, many important gaps and challenges related to the access to, and effective use of, adaptation funding are still present, and Viet Nam needs to implement breakthrough solutions to overcome these challenges.

Firstly, adaptation resources have mainly been spent on large-scale hard infrastructure, which is often designed without full recognition of the systemic nature of the risks and uncertainties associated with future climate change. These exposure-reduction and pure optimization strategies may lead to a perception that the future climate is predictable, and that adaptation is simply a technical problem. This perception is considered no longer appropriate to deal with a context of uncertain climate change. Some infrastructure is still necessary, but some may also increase existing risks or create new ones. Therefore, it is important to shift the main focus of the adaptation approach from exposure reduction and building hard infrastructure to reducing vulnerability, risk mitigation, and adaptive capacity building. When needed, hard infrastructure should be planned and designed using open, robust and flexible approaches that enable current and future climate-related risks to be accommodated. In addition, by putting more emphasis on nature-based solutions and lowering potential climate impacts on new

general infrastructure, investments will contribute to sustainable economic development and also adaptation outcomes.

Secondly, this chapter indicates a major funding gap for adaptation between the national and local levels, and especially at the community level. There is no single solution to this problem, which requires interventions at multiple scales. On the one hand, government agencies should be better prepared, with the capacity and eligibility to access more funding both from global adaptation-related resources and from the private sector. One the other hand, breakthrough measures should be taken to ensure the effective use of available funding. Specifically, instead of focusing on hard infrastructure and on reducing exposure, more funding should be allocated to other measures that target social, institutional, and economic dimensions of vulnerability and adaptation, especially at the local level. In addition, instead of relying on external support and on resources specifically designed for adaptation, available funding for development should be mobilized and used in ways that support adaptation, and at the same time ensure resilient and risk-informed development. In doing so, a strong legal foundation and practical guidelines need to be in place, to ensure full integration of adaptation into Socio-Economic and Sectoral Development Plans, and into the annual and medium-term budget planning process at the national, provincial and lower levels. More importantly, a monitoring, reporting, and verifying system should be placed at the core of Viet Nam's adaptation strategy. Without good statistical information, it remains difficult to assess the state and dynamics of adaptation finance. In addition, it is urgent to develop and apply comprehensive and practical frameworks and indicators, to assess how adaptation projects contribute to reducing vulnerability and increasing resilience. Finally, at the global level, a strong international financial commitment to directly support local vulnerable communities is also required.

Adaptation funding will be a key issue for Viet Nam in the next decades as climate change worsens. The landscape of adaptation finance today gives us insights into the types of adaptation projects that may be financed, which carry some risks. Breakthrough policy solutions will be required to overcome the many challenges, as described in this chapter. Finally, it is important to highlight that while Viet Nam will need more resources for adaptation, it is not only the level of and access to funding that matter, but also the ways in which available resources are used and allocated, and adaptation interventions are designed.

References

Adger, W. N. (2000). Institutional adaptation to environmental risk under the transition in Viet Nam. *Annals of the Association of American Geographers,* 90(4), 738-758.

AFD – Agence Française de Developpement. (2017). *Evaluation Summary of Ho Chi Minh city Finance and Investment State-owned Company credit line (HFIC)*. Retrieved from: https://www.afd.fr/en/ressources/evaluation-summary-ho-chi-minh-city-finance-and-investment-state-owned-company-credit-line-hfic

AFD – Agence Française de Developpement. (2017). *From global to local: subnational development banks in the era of sustainable development goals.* https://www.afd.fr/en/ressources/global-local-subnational-development-banks-era-sustainable-development-goals

An Giang PPC. (2015). *Report on the review and assessment of the implementation of the National Target Program to Respond to Climate Change for the 2010-2015 period.*

Awolala, D. O., & Ajibefun, I. A. (2015). Rice farmers' vulnerability to extreme climate: Deploying local adaptation finance in Ekiti State, Nigeria. *World Environment*, 5(3), 91-100.

Ayesha, D., & Colleen, M. (2019). *Assessing the Effectiveness of Climate Resilience Grants to Local Governments in Least Developed Countries*. Working Paper. Washington, DC: World Resources Institute. Retrieved from at https://www.wri.org/publication/assessing-effectiveness-climateresilience-grants-local-governments-least-developed

Bac Kan PPC. (2015). *Report on the review and assessment of the implementation of the National Target Program to Respond to Climate Change for the 2010-2015 period*.

Balboni, C. A. (2019). In Harm's Way? Infrastructure Investments and the Persistence of Coastal Cities. Department of Economics, Massachusetts Institute of Technology. Retrieved from https://www.dropbox.com/s/16p58q2ps18sscm/Clare%20Balboni%20Living%20on%20the%20edge.pdf

Banhalmi-Zakar, Z., Ware, D., Edwards, I., Kelly, K., Becken, S., & Cox, R. (2016). Mechanisms to finance climate change adaptation in Australia. *National Climate Change Adaptation Research Facility Gold Coast.*

Barrett, S. (2015). Subnational Adaptation Finance Allocation: Comparing Decentralized and Devolved Political Institutions in Kenya. *Global Environmental Politics*, 15(3), 118-139.

Baum J., Camila Bustos, Alexis Durand, Michael Murphy, Olivia Santiago, Timmons Roberts, & Saleemul Huq. (2015). Adaptation Aid Projects: Genuinely Categorized? In *AdaptationWatch (Ed.). Toward mutual accountability: the 2015 adaptation finance transparency gap report.Policy Briefing*. Retrieved from AdaptationWatch.org

Ben Tre PPC. (2015). *Report on the review and assessment of the implementation of the National Target Program to Respond to Climate Change for the 2010–2015 period*.

Ca Mau PPC. (2020). *Action plan to respond to climate change of Ca Mau Province for the 2021–2030 period with vision to 2050*.

Can Tho PPC. (2016). *Report on the review of the implementation of the National Target Program to Respond to Climate Change for the 2010-2015 period*.

CBI – Climate Bonds Initiative. (2018), *ASEAN Green Finance – State of the market*. Retrieved from https://www.climatebonds.net/files/files/ASEAN_GreenFin_SotM_CBI_012019.pdf

Dafermos, Y., Gabor, D., & Michell, J. (2021). The Wall Street Consensus in pandemic times: what does it mean for climate-aligned development?. *Canadian Journal of Development Studies*, 42 (1-2), 238-251.

PPC. (2015). *Report on the review and assessment of the implementation of the National Target Program to Respond to Climate Change for the 2010-2015 period*.

Delisle, S., & Turner, S. (2016). 'The weather is like the game we play': Coping and adaptation strategies for extreme weather events among ethnic minority groups in upland northern Viet Nam. *Asia Pacific Viewpoint*, 57(3), 351-364.

Dessai, S., & Wilby, R. (2011). How can developing country decision makers incorporate uncertainty about climate risks into existing planning and policymaking processes. *World Resources Report Uncertainty Series. Washington, DC: World Resources Institute*.

Dien Bien PPC. (2015). *Report on the review and assessment of the implementation of the National Target Program to Respond to Climate Change for the 2010-2015 period*.

DiGregorio, M., & Van, H. C. (2012). Living with floods: a grassroots analysis of the causes and impacts of Typhoon Mirinae. *ISET– Viet Nam*, Hanoi, Viet Nam.

Eckardt, S., Demombynes, G., & Chandrasekharan Behr, D. (2016). *Viet Nam-systematic country diagnostic. Sustaining success Priorities for inclusive and sustainable growth*. World Bank Group. Hanoi. Retrieved from https://documents1.worldbank.org/curated/en/334491474293198764/pdf/108348-REVISED-PUBLIC-ACS.pdf

ECORYS. (2018). *Ex-post evaluation of the Budget Support Program to Respond to Climate Change in Viet Nam*.

Fenton, A., Gallagher, D., Wright, H., Huq, S., & Nyandiga, C. (2014). Up-scaling finance for community-based adaptation. *Climate and Development*, 6(4), 388-397.

Fischer, I., Beuchelt, T., Dufhues, T., & Buchenrieder, G. (2011). Risk management networks of ethnic minorities in Viet Nam. *Asia Pacific Development Journal*, 17(2), 93-118.

Fortier, F. (2010). Taking a climate chance: A procedural critique of Viet Nam's climate change strategy. *Asia Pacific Viewpoint*, 51(3), 229-247.

GoV. (2016). *Plan for the implementation of the Paris Agreement*.

GoV. (2017). *Decision No. 1670/QD-TTg dated on 31/10/2017 on the approval of the National Target Program to respond to Climate Change and Green Growth*.

Grasso, M. (2010). *Justice in Funding Adaptation under the International Climate Change Regime*. London New York: Springer.

Ha Nam PPC. (2015). *Report on the review and assessment of the implementation of the National Target Program to Respond to Climate Change for the 2010-2015 period*.

Hai Phong PPC. (2015). *Report on the review and assessment of the implementation of the National Target Program to Respond to Climate Change for the 2010-2015 period*.

Hai Phong PPC. (2020). *Action plan to respond to climate change of Hai Phong city for the 2021–2030 period with vision to 2050*.

Hall, N. (2017). What is adaptation to climate change? Epistemic ambiguity in the climate finance system. *International Environmental Agreements*: Politics, *Law and Economics*, 17(1), 37-53.

Hallegatte, S. (2009). Strategies to adapt to an uncertain climate change. *Global Environmental Change*, 19(2), 240-247.

Khan, M., Robinson, S., Weikmans, R., Ciplet, D., & Roberts, J. T. (2020). Twenty-five years of adaptation finance through a climate justice lens. *Climatic Change*, 161(2), pp. 251–269.

Klinke, A., & Renn, O. (2002). A new approach to risk evaluation and management: Risk-based, precaution-based, and discourse-based strategies. *Risk Analysis*, 22(6), 1071-1094.

Lempert, Nakicenovic, N., Sarewitz, D., & Schlesinger, M. (2004). Characterizing climate-change uncertainties for decision-makers. An editorial essay. *Climatic Change*, 65(1-2), 1-9.

Lindegaard, L. S. (2013). *The infrastructure bias in Vietnamese climate change adaptation:* DIIS Working Paper.

McElwee, P. (ed). (2010). "The Social Dimension of Adaptation to Climate Change in Viet Nam", *Discussion paper n°17*, the World Bank.

McElwee, P. (2017). "Viet Nam's Urgent Task: Adapting to Climate Change". *Current History*, 116, 223–229.

Milly, P. C. D., Betancourt, J., Falkenmark, M., Hirsch, R. M., Kundzewicz, Z. W., Lettenmaier, D. P., & Stouffer, R. J. (2008). Stationarity Is Dead: Whither Water Management? *Science*, 319(5863), 573-574.

Nguyen, Q. A., Miller, F., Bowen, K., Tan Sinh, B. (2017). Evaluating capacity for climate change adaptation in the health and water sectors in Viet Nam: constraints and opportunities, *Climate and development*, 9(3), 258-273.

Nguyen D. (2020), *Hanoi needs 3,9 billion for social housing projects*. Retrieved from https://e.vnexpress.net/news/business/industries/hanoi-needs-3-9-bln-for-social-housing-projects-4187495.html

Ninh Thuan PPC. (2015). *Report on the review and assessment of the implementation of the National Target Program to Respond to Climate Change for the 2010-2015 period*.

Padraig, O., Clark, A., & Meattle, C. (2018). *Global Climate Finance: An Updated View 2018*. Climate Policy Initiative. Retrieved from https://www.climatepolicyinitiative.org/wp-content/uploads/2018/11/Global-Climate-Finance-_-An-Updated-View-2018.pdf

Pannier, E., Vu, T. C., Espagne, E., Pulliat, G., & Nguyen, T. T. H. (2020). The Three Dialectics of Adaptation Finance in Viet Nam. *Sustainability*, 12(18), 7691.

PEAPROS. (2012). *Mid-Term Review of the implementation of SP-RCC in the Socialist Republic of Viet Nam*.

Pham, N. T. T., Nong, D., & Garschagen, M. (2019). Farmers' decisions to adapt to flash floods and landslides in the Northern Mountainous Regions of Viet Nam. *Journal of Environmental Management*, 252, 109672.

Phuong, L. T. H., Biesbroek, G. R., & Wals, A. E. J. (2018). Barriers and enablers to climate change adaptation in hierarchical governance systems: the case of Viet Nam. *Journal of Environmental Policy & Planning*, 20(4), 518-532.

Pickering, J. (2012). *Adaptation finance in the Asia-Pacific region: strengthening fairness, effectiveness and transparency in allocation*. Paper presented at the Workshop on Climate Change Governance in the Asia-Pacific Region: Agency and Adaptiveness. Australian National University (ANU), Canberra.

Priambodo, C., Streiferdt, V., Tänzler, D., & Semmling, E. (2013). *Status of climate finance in Viet Nam–Country Assessment Report*. Final report.Climate and Development Knowledge Network (CDKN).

Pulliat, G., & Pannier, E. (2016). Échanges, dons et dettes. Réseaux sociaux et résilience dans le Viet Nam d'aujourd'hui. *Revue Tiers Monde*, 226-227, 95-121.

Pulliat G. (2019) The Implementation Gap: Environmental Rhetoric Versus Reality in Lao Cai, Viet Nam. In: A. G. Daniere & M. Garschagen (Eds.). *Urban Climate Resilience in Southeast Asia* (pp. 201–222). The Urban Book Series. Cham: Springer International Publishing.

Quang Nam PPC. (2020). *Action plan to respond to climate change of Quang Nam Province for the 2021–2030 period with vision to 2050*.

Roberts, J. T., & Weikmans, R. (2017). Postface: fragmentation, failing trust and enduring tensions over what counts as climate finance. *International Environmental Agreements: Politics, Law and Economics*, 17(1), 129–137.

Sancken, L. E. (2020). The Price of Sovereignty in the Era of Climate Change: The Role of Climate Finance in Guiding Adaptation Choices for Small Island Developing States. *UCLA Journal of Environmental Law and Policy*, 38(2). Retrieved from https://escholarship.org/uc/item/0b04s26g#&sid=oa&domaine=inshs&doi=null

Schwab, M. (2014). *Nature and values of coping and adaptation, an evaluation of response mechanisms to changing water related risks in rural areas of the Vietnamese Mekong Delta*. PhD thesis, United Nations University.

Soltoff B., Laura Razzuri, Peterson, A., Carvalho, & Cruz, K. D. (2015). *Ensuring Adaptation Finance Accountability*.

Son, H.; Kingsbury, A. 2020. Community Adaptation and Climate Change in the Northern Mountainous Region of Viet Nam: A Case Study of Ethnic Minority People in Bac Kan Province. *Asian Geographer*, n°37: 33–51.

Soanes M., Rai N., Steele P., Shakya C., & Macgregor J. (2017). *Delivering real change: Getting international climate finance to the local level:* International Institute for Environment and Development. London. Retrieved from https://pubs.iied.org/sites/default/files/pdfs/migrate/10178IIED.pdf

Stacey, R. D. (1996). *Complexity and creativity in organizations:* Washington, DC. Berrett-Koehler Publishers.

Toan Vu. (2017). *Barriers to enabling principles of uncertainty and controversy in urban flood decision-making, the case of Quy Nhon city, Viet Nam in the context of climate change*, PhD thesis, University of the Sunshine Coast.

Trabacchi, C., & Buchner, B. K. (2017). Adaptation Finance: Setting the Ground for Post-Paris Action. In A. Markandya , I. Galarraga ,& D. Rübbelke (Eds)*, Climate finance: theory and practice (pp. 35-54).* New Jersey: World Scientific.

Tran, T. A., & Rodela, R. (2019). Integrating farmers' adaptive knowledge into flood management and adaptation policies in the Vietnamese Mekong Delta: A social learning perspective. *Global Environmental Change*, 55, 84-96.

Wilby, R. L., & Dessai, S. (2010). Robust adaptation to climate change. *Weather*, 65(7), 180-185.

World Bank. (2015a). *Financing Viet Nam's response to climate change: building a sustainable future - key findings and recommendations of the climate public expenditures and investment review*.

World Bank. (2015b). *Financing Viet Nam's response to climate change: smart investment for a sustainable future. Laying the foundation for resilient low-carbon development through Climate Public Expenditure and Investment Review*. Retrieved from https://vietnam.un.org/sites/default/files/2019-08/ietnam%20CPEIR%20Report%20%20%28ENG%29.pdf

Climate change in Viet Nam
Impacts and adaptation

A COP26 assessment report
of the GEMMES Viet Nam project

This COP26 Report of the GEMMES Viet Nam project was prepared by a team led by Senior Economist Etienne Espagne [AFD], in close cooperation with the General Director of the Department of Climate Change of the Ministry of Natural Resources and the Environment The Cuong Tang [MoNRE].

Thanh Ngo-Duc [USTH], Manh-Hung Nguyen [TSE], Emmanuel Pannier [IRD] and Marie-Noëlle Woillez [AFD] were task team leaders of different parts of the project and helped as members of the report's leadership. Alexis Drogoul [IRD] was instrumental in the smooth research and administrative collaboration between AFD and IRD throughout the report's writing process.

The core team was composed of Etienne Espagne [AFD], Alexis Drogoul [IRD], Thi Phuong Linh Huynh [IRD], Toan Thuy Le [CESBIO], Thanh Ngo-Duc [USTH], Manh-Hung Nguyen [TSE], Thi Thu Ha Nguyen [LASTA],Truong Toan Nguyen [University of Queensland], Tu Anh Nguyen [IMHEN], Emmanuel Pannier [IRD], Frédéric Thomas [IRD], Chi Quang Truong [CTU], Quoc Thanh Vo [CTU], Canh Toan Vu [ISET] and Marie-Noëlle Woillez [AFD].

Members of the extended team provided invaluable contribution to the report's chapters: Hironori Arai [CESBIO]; Alexandre Bouvet [CESBIO]; Christian Culas [CNRS]; Quang Thinh Dang [IMHEN]; Thi Thu Hoai Dang [CIEM]; Irene De Eccher [IRD]; Yoro Diallo [CERDI]; Hong Xuan Do [Nong Lam Univ]; Alexis Drogoul [IRD]; Sepehr Eslami [UU]; Benoit Gaudou [IRD]; Aditya Goenka [Birmingham University]; Boi Yen Ha [PSE]; Hoang Diem [UDE]; Quang Nghi Huynh [CTU]; Thi Lan Huong Huynh [IMHEN]; Anoulak Kittikhoun [MRC]; Stephane Lagrée [IRD, Wanasea]; Van Chon Le [IREEDS]; Elodie Mania [Uni. De Rouen]; Stephane Mermoz [CESBIO]; Philip Minderhoud [WG]; Cong Thao Nguyen [VASS]; Hieu Trung Nguyen [CTU]; Hong Quan Nguyen [ICED]; Huu Quyen Nguyen [IMHEN]; Lam Dao Nguyen [VNSC-STAC]; Lan Anh Nguyen [IREEDS]; Minh Bao Nguyen [IE]; Phuong Thao Nguyen [IMHEN]; Thao Hong Nguyen [CTEC]; Thi Thanh Hue Nguyen [IMHEN]; Thi Thu Ha Nguyen [Universite de Rouen]; Thi Tuyet Nguyen [MPI]; Thu Ha Nguyen [Thuyloi Univ]; Van Hong Nguyen [IMHEN]; Viet Cuong Nguyen [MRDI]; Viet Tien Nguyen [IREEDS]; Emmanuel Pannier [IRD]; Long Bao Pham [IMHEN]; Minh Thu Pham [ILSSA]; Dang Duy Anh Phan [ECARES-ULB]; Khanh Van Phan [UWE]; Phuong Anh Phan [USSH]; Thi Kim Tam Phan [USSH]; Gwenn Pulliat [CNRS]; Arsene Rieber [Uni. De Rouen]; Gregoire Sempe [PSE]; Michel Simioni [INRAE]; Patrick Taillandier [IRD]; Olivier Tessier [EFEO]; Anh Quan Tran [HUMG]; Thi Anh Dao Tran [Université de Rouen]; Hoang Duong Trinh [IMHEN]; Ba Kien Truong [IMHEN]; Dinh Suc Vo [IMHEN]; Thi Phuong Linh Vo [CTU]; Duc Liem Vu [HNUE]; Van Thang Vu [IMHEN].

The team would like to thank the reviewers of the different chapters of the report: Edward Anthony [CEREGE]; Tan Sinh Bach [NISTPASS]; Van Kham Duong [IMHEN]; Jean-Baptiste Fressoz [CNRS]; Thanh Long Giang [NEU]; Marc Goichot [WWF Lead Freshwater Asia Pacific]; Cong Hoa Ho [CIEM]; Anh Tuan Hoang [USSH]; Tuan Anh Luong [De Montfort University]; Anh Tuan Nguyen [IE]; Duc Khuong Nguyen [IPAG Business School, Paris]; Minh Nguyen [CSIRO]; Thanh Chung Nguyen [NIHE]; Thanh Cong Nguyen [DCC, MoNRE]; The Chinh Nguyen [IMHEN]; Thi Dieu Trinh Nguyen [MPI]; Tu Anh Nguyen [Central Party's Economic Commission]; Van Cu Pham [UQAM]; Van Tan Phan [VNU University of Science]; Alex Smajgl [MRFI]; Thanh Nga Tran [DCC, MoNRE]; Thuc Tran [Vietnam Association of Meteorology and Hydrology]; Thomas Vallée [French Embassy in Phnom Penh]; Tat Thang Vo [UEH]. They helped the team improve a lot the clarity and scientific value of the results, as well as the policy relevance of the recommendations. All remaining errors are the responsibility of the team.

The team would also like to thank the following colleagues for their guidance during the preparation of the Report: Cécile Aubert [TSE]; Emmanuelle Augeraud-Véron [GRETHA]; Robert Boyer [Institut des Amériques]; Jean-Louis Brillet [consultant]; Dinh Tuan Bui [MOH]; Quang Tuan Bui [VASS]; The Anh Dao [VASS]; Nicolas De Laubier Longuet Marx [Columbia University]; Antoine Godin [AFD]; Viet Ngu Hoang [QUT]; Thi Phuong Linh Le [IREEDS]; Thi Phuong Mai Le [NIHE]; Van Cuong Le [Paris School of Economics]; Guilherme Magacho [AFD]; Sébastien Marchand [CERDI]; Jacques Mazier [Paris 13, CEPN]; Florent Mc Isaac [AFD]; Nicolas Meisel [AFD]; Son Nghiem [Griffith University]; Nhat Anh Nguyen [TSE]; Thang Nguyen [VASS]; Tuan Nguyen [IREEDS]; Tuan Anh Nguyen [VNU Hanoi]; Van Huy Nguyen [HN Medical University]; Ngoc Duy Nong [CSIRO]; Lan Huong Pham [ex-CIEM]; Luis Reyes [Kedge Business School]; Arnaud Reynaud [TSE]; Cong Thang Tran [IPSARD]; Thi Thuong Vu [IREEDS]; Devrim Yilmaz [AFD]. The team benefited a lot from these lively discussions in seminars and webinars, as well as more technical collaborations.

We also benefited from the technical advice of Hoang Mai Pham, Director General of Foreign Economic Relations Department at the Ministry of Planning and Investment. Finally, Most Venerable Thich Duc Thien, Vice President and General Secretary of the Vietnam Buddhist Sangha provided early support in the project and in its diffusion towards the general public.

The Report was edited by Marianne Smolska and proofread by Etienne Espagne. Marianne Smolska was also the principal graphic designer. The team would also like to thank Nicholas Le Quesne, who managed the English editing of the chapters and summaries. Elodie Martinez and Charlotte Le Layo offered guidance, and support on communication and dissemination.

The team is grateful to former AFD chief economist Gaël Giraud, who contributed to the kick-off meeting of the GEMMES Viet Nam project in Hanoï in March 2018, to former director of the department of economic analysis and policy dialogue Vincent Caupin for his support throughout the beginning of the project, to current director Hélène Djoufelkit for her trust in the scientific dynamics of the team and her technical support at all critical moments, and to executive director of innovation, research and knowledge Thomas Mélonio. Serge Perrin provided instrumental support in the policy diffusion of the report at COP26 and throughout the project funding by Facility 2050.

The AFD agency in Hanoï was instrumental in the process that led to this report, especially in the difficult COVID times. Special thanks go to Fabrice Richy, director of the agency (2017–2021), Virginie Bleitrach, deputy director of the agency (2017–2021), Huong-Hue Nguyen, project manager, and Maylis Garcia, international volunteer in Hanoï (2019–2021).

The IRD Representative Office in Vietnam played a key role in coordinating and supporting the research teams that contributed to this report. Special thanks go to representative of IRD in Viet Nam and Philippines Alexis Drogoul, who supported this very fruitful collaboration between AFD and IRD from the onset. Thi Linh Ha Nguyen managed the printing and played a virtuoso administrative coordination role throughout the preparation of the report. Thi Cam Van Tran, chief accountant, Ha Linh Nguyen, human resources manager, Phuong Anh Nguyen, communication officer, and Jeanne Cottenceau, scientific cooperation officer, particularly contributed to IRD support.

Finally, the team apologizes to any individuals or organizations that contributed to this Report but were inadvertently omitted from these acknowledgments.

Le groupe AFD contribue à mettre en œuvre la politique de la France en matière de développement et de solidarité internationale. Composé de l'Agence française de développement (AFD), en charge du financement du secteur public et des ONG, de la recherche et de la formation sur le développement durable, de sa filiale Proparco, dédiée au financement du secteur privé, et bientôt d'Expertise France, agence de coopération technique, le Groupe finance, accompagne et accélère les transitions vers un monde plus juste et résilient.

Nous construisons avec nos partenaires des solutions partagées, avec et pour les populations du Sud. Nos équipes sont engagées dans plus de 4 000 projets sur le terrain, dans les Outre-mer, dans 115 pays et dans les territoires en crise, pour les biens communs — le climat, la biodiversité, la paix, l'égalité femmes-hommes, l'éducation ou encore la santé. Nous contribuons ainsi à l'engagement de la France et des Français en faveur des Objectifs de développement durable (ODD). Pour un monde en commun.

AFD Group implements France's policy in the areas of development and international solidarity. The Group includes Agence Française de Développement (AFD), which finances the public sector and NGOs, as well as research and education in sustainable development; its subsidiary Proparco, which is dedicated to private sector financing; and soon, Expertise France, a technical cooperation agency. The Group finances, supports and accelerates transitions towards a fairer, more resilient world.

With our partners, we are building shared solutions with and for the people of the Global South. Our teams are at work on more than 4,000 projects in the field, in the French Overseas Departments and Territories, in 115 countries and in regions in crisis. We strive to protect global public goods — promoting a stable climate, biodiversity and peace, as well as gender equality, education and healthcare. In this way, we contribute to the commitment of France and the French people to achieve the Sustainable Development Goals (SDGs). Towards a world in common.

Please cite the work as follows:

Espagne E. (ed.), T. Ngo-Duc, M-H. Nguyen, E. Pannier, M-N. Woillez, A. Drogoul, T. P. L. Huynh, T. T. Le, T. T. H. Nguyen, T. T. Nguyen, T. A. Nguyen, F. Thomas, C. Q. Truong, Q. T. Vo, C. T. Vu. 2021. Climate change in Viet Nam; Impacts and adaptation. A COP26 assessment report of the GEMMES Viet Nam project. Paris. Agence Française de Développement.